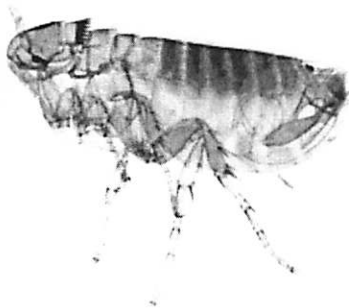


Feb/24/2011

### Report on Bubonic Plague

Diseases-This is what kills and has been killing millions of us for years. In only a few, short years, they can wipe out whole communities. Out of these diseases, one happens to be very well-known and extremely dangerous. In only 5 years, it killed 1/3 of Europe's population. It comes in 3 different forms and the one I will mention is the Bubonic Plague. What are the symptoms, is there a cure, who discovered it, why is it important in history-you are about to find out the answers to all these questions and more.

The bubonic plague is known by many names-Black Death, Black Plague, Great Plague, Great mortality, and the Great Pestilence. But why was it called all of these names? Firstly, it was named the Black Death for one main reason-the disease caused black spots on your body which soon lead to death, thus giving the name the Black Death. The name Black Plague came from the Black Death. Plague means a disease that is spread by rats. It is a combination of Black Death and the word "plague." Great Plague is a modification of the Black Plague. A plague can also mean an epidemic that kills many people. Since it had been recorded (for diseases) to have a very high mortality rate, it is called the Great Plague. Mortality means number of deaths. As mentioned before, quite a lot of people died, therefore giving the name the Great Mortality. Pestilence means a disease that is dangerous, kills a lot of people, and is spread by rodents. Since it was so important in history, it was called the Great Pestilence. The final name, the bubonic plague is because of the lumps formed on the body. The lumps formed are called buboes, thus giving the name The Bubonic Plague. Bubo, specifically, means a lump formed when the lymph nodes are swollen, which is what happens when you come down with the Bubonic Plague. It should be noted that some may use a couple of these names to refer to all 3 types of the plague. The bacteria that caused the plague were discovered much later. It was found by a group led by Alexandre Yersin, a former student of Louis Pasteur. He named the bacteria after himself - Yersina Pestis. He also came up with a medicine to fight off the plague. It was harder to cure than most diseases because the Yersina Pestis has evolved greatly and changes rapidly due to its frequent genetic exchange with other microorganisms. Due to its ability to adapt easily, it can live in many different places.



The bubonic plague is caused by the fleas. It is the rats or the rodents who are originally infected. The fleas bite the rodents/rats and spread it to the humans. The bacteria would multiply inside the flea's stomach. Soon the flea can no longer eat, so it brings the bacteria onto its sucker. Therefore when it bites another human, the bacteria goes through the bite and reaches the human body. The bacilli would then affect their lymphatic system. As mentioned before, the lymph nodes would swell causing painful lumps or "buboes." These buboes were usually found near the armpits, groin, or neck. The location of the buboes would vary depending on the location of your flea bite. Another way one could get the disease would be by handling an infected animal. The disease is caused by the bacterium *Yersinia Pestis*. During the Medieval Times, people came up with different (incorrect) theories. Some believed it was a punishment from God to mankind for their sins. One popular theory was that it was caused by miasmas- air that was poisonous and killed all those that inhaled it. Others believed it was that the Jews were poisoning wells. This led to killing of the Jews. Some said it was the cats and dogs, so people went out and slaughtered cats and dogs. This of course, had an opposite reaction. Cats would often kill rats, but with cats gone, the rat population thrived and the disease spread quicker. The disease also spread faster due to lack of hygiene. Trash left on the streets attracted rats therefore resulting in more deaths. Another belief was that it was caused by smells. This led to people carrying around "posies" in their pocket. One very well known rhyme talks about the plague- "Ring-a-ring-a-roses." Ring-a-ring-a-roses is referring to the red irritated skin. Pocket full of posies is talking about the people who would carry posies in belief it would cure them (which it didn't) or the fact that there were many funerals thus many flowers. Atishoo, Atishoo is talking about all the ashes that were causing people to sneeze. Many bodies were burnt, therefore making a lot of ash. We all fall down means that the people were dying at a very fast pace.



The Bubonic Plague not only affects humans and rats, but other creatures. These creatures include ground squirrels, dogs, chipmunks, mice, and voles. Fleas carry the disease, but do not appear to

suffer from it. Even though other animals suffer from it, it is not very noticed. Humans in general seem to be more susceptible (or we only worry about ourselves and don't pay attention to others).



The bubonic plague seems to appear in semi-arid areas. It was first spotted in the 1330's in China. From China, it spread to the rest of the world through the rats/rodents on board. It seems not to have any problem surviving in different temperatures. As long as there are rodents and fleas, it can thrive. Therefore, the climates it lives in must be a climate suitable for rodents. Warm climates would be ideal. If it is too hot, the bacteria itself cannot survive. It, however, has been mentioned that in cold places, where it snows during winter, the black plague stops for a while. Scientists believe that this is so because the fleas/rodents died of cold or were either hibernating. Since there were no vectors (an organism that spreads diseases to another organism), there was no way to spread the disease. However, when summer came back, the bubonic plague resurfaced. It should be noted that the black plague is no longer present other than a few minor cases that were dealt with quickly. A cure has been found, which will be mentioned later on.

The bubonic plague has affected a lot of people due to the fast rate that it kills people at. In 5 short years, around 25 million died in Europe-that's nearly 1/3 of Europe's population. Between 1334 and 1771, it has been recorded that approximately 75 million died. People died within 4-7 days. 4 out of 5 people died within 8 days. The symptoms appear within 2-6 days. Without treatment, 50-90% of people will die. The bubonic plague is a fast spreading disease and got rid of people very quickly. Whenever people would think it had gone, it would come back and kill a whole community of people.



From what has been found, everyone is vulnerable. In the past, when there was no cure, fleeing was the safest option. Some of course survived but it does not appear to be due to different genetic qualities. Mainly, if you were fit and healthy before you got the plague you would have more chance of survival. Most people who survived had barely made it and somehow pulled through. Also, if you do not come in contact with rodents or fleas, you are safer than other people. One interesting theory is that people whose ancestors were black plague survivors were immune to HIV. This of course, is a theory that people are developing. It hasn't been fully proved.



Technically, the bubonic plague is neither acute nor chronic. It is definitely not a chronic disease. A chronic disease is a disease that lasts a long time. The bubonic plague kills a person within a week, which is not a long period of time. Therefore it can't be chronic. An acute disease is a disease that causes immediate health crisis. Even though the black plague causes immediate health crisis, it also kills the person. Therefore, it doesn't match the description of an acute disease perfectly. The bubonic plague would be considered a deadly disease. However, if I had to choose between the two, the bubonic plague is definitely more like an acute disease.

The symptoms of the black plague include fever, headaches, and chills, feeling very tired and abdominal pain. Other symptoms are muscle aches, feeling ill and even seizure. These are the symptoms that are easily confused with other diseases/colds/viruses. The main way to tell if someone has the bubonic plague is by the buboes that form. As mentioned many times, the buboes are lumps that are formed because the lymph glands have swollen. The bacteria move through the bloodstream until it reaches the lymph glands. Then it attacks the gland and infects it. This causes the lymph glands to swell. Bubonic plague can lead to septicemic plague if it is not tended to. Septicemia is a different type of plague that is caused by the same bacteria but is transmitted differently. Often people will feel pain in the area where the bubo is forming. The best way to tell if you have the bubonic plague is to see if you have any of the symptoms along with swelling/black skin near the armpits, groin and neck. If you have been in contact with a rodent or have been very close to one, it'd be best to go check with a doctor to be sure. Scientists will take a sample and check in the lab to see whether or not it really is *Yersinia Pestis*.



The bacteria *Yersinia Pestis* insert toxins into the defense/immunity cells causing them to stop functioning. Once the immunity cells are out of the way, it continues to reproduce at a fast rate. As explained before, the lumps formed are due to the swelling of the lymph nodes that are attacked by the bacteria. The rest of the symptoms-fever, headaches, stomach/muscle pains- are an effect of the body malfunctioning and the body starting to die. I believe that the weak immunity system results in the virus-like symptoms.

The bubonic plague had a huge impact on society in many ways. One of these was people faith in God. Many would pray to God for a cure, but a cure never came. People soon started to question God and whether he really existed. Europe's population drastically decreased due to deaths or people fleeing. Many people attempted to cure the bubonic plague in many different ways which I mentioned above. This included things such as carrying posies, which didn't help, and killing cats, which backfired. Some extremists whipped themselves because they believed it would satisfy God. These people believed that the plague was a punishment from God. They thought whipping would be payment for their sins. During the plague, many died and there was a food shortage. The farmers who plowed the fields were dead, dying, or sick. Food prices shot up. Overall, the black plague caused people to come up with new, extreme ideas, many of which were useless. It also greatly impacted the feudal system. Originally, peasants couldn't leave unless they had their master's permission. Since there was a shortage of workers, lords persuaded the remaining peasants to come work in their field. Once the peasants started working, they wouldn't be allowed to leave. The peasants demanded higher salaries since they knew the lord were desperate for workers. This resulted in the governments passing laws limiting the wages of workers. Anger started to build up and finally in 1381, the "Peasants Revolt" took place. The feudal system started to crumble.

In the past there was no cure, however nowadays you can get treatment to stop the disease. The 2 methods are antibiotics or a vaccine, though the vaccine is more of a prevention measure. The antibiotics should be taken as soon as possible. If they are not taken within 24 hours after symptoms

appear, death may be inevitable. The main antibiotic used is streptomycin, but there are others such as gentamicin, doxycycline, or ciprofloxacin. If the case is severe, it is taken through an IV line. If it is minor, the medicine is taken through the mouth. The vaccine is for people who work in conditions that may result in the bubonic plague. However, the effectiveness of the vaccine is not certain.

Bubonic plague has been used as a weapon in war. The Japanese attempted to use it on a small village. They flew a plane over the village and dropped a ceramic container. It had flour and fleas inside. The idea was that the container would break and spill the flour and fleas. The flour would attract rats. The fleas would then get on the rats and spread the disease throughout the village. The entire village came down with bubonic plague and died. It proved to be successful. The Japanese scheduled to do the same with USA in WW2. The plan was to unfold in September, 1945. However, before they could do anything, the Americans dropped the atomic bomb in August. Another attempt had been made by a racist man in an Ohio lab. Luckily, he was stopped before any damage was done.

The bubonic plague appeared more than once. It was like a cycle. It'd go and come. In 224 B.C.E., a case was reported in China. In the 14<sup>th</sup> century (1347) a large outbreak took place. Within 5 years, 25 million were gone. The disease would come in the summer and go in the winter (reason is mentioned earlier). In 1353, the bubonic plague was still there, but it had calmed down. Most of the damage had already been done. In London, the plague kept on recurring. 1563, 1593, 1603, 1625, 1636, and 1665- these were the years in which the plague appeared. London's population decreased by 10-30%. In 1630, Italy took a hard hit from the plague. 35-69% of the people died. In 1720, the plague reappeared in Marseille-it reduced the population by 40%. The plague kept on going in a cycle for 400 years until a cure was found. Although it has not been completely eradicated, the bubonic plague is no longer a big threat to the world.

"Bubonic Plague." *Info Please*. N.p., n.d. Web. 27 Feb 2011.

<<http://www.infoplease.com/cig/dangerous-diseases-epidemics/bubonic-plague.html>>.

"Bubonic Plague and Black Death." *William Shakespeare Information*. N.p., n.d. Web. 27

Feb 2011. <<http://www.william-shakespeare.info/william-shakespeare-bubonic-plague-black-death.html>>.

"Bubonic Plague." *ZKEA*. N.p., n.d. Web. 27 Feb 2011.

<<http://www.zkea.com/archives/archive02005.html>>.

"Deathface." *Facing Sudan*. N.p., n.d. Web. 27 Feb 2011.

<<http://www.facingsudan.com/deathface.html>>." *Deathface.* *Facing Sudan*. N.p., n.d. Web. 27 Feb 2011. <<http://www.facingsudan.com/deathface.html>>.

"Factsheets." *CFSPH*. N.p., n.d. Web. 27 Feb 2011.

<<http://www.cfsph.iastate.edu/Factsheets/pdfs/plague.pdf>>.

Fisher, Sim Cha. "Christmas is over and now i can die." *Wordpress*. N.p., n.d. Web. 27 Feb 2011. <<http://simchafisher.wordpress.com/2010/12/29/7-slow-takes-christmas-day-is-over-and-now-i-can-die/>>.

"Lymph Glands Swollen." *Patient UK*. N.p., n.d. Web. 27 Feb 2011. <<http://www.patient.co.uk/health/Lymph-Glands-Swollen.htm>>.

"Plague Home Page." *CDC*. N.p., n.d. Web. 27 Feb 2011. <<http://www.cdc.gov/ncidod/dvbid/plague/>>.

"Plague Infection." *DHPE*. N.p., n.d. Web. 27 Feb 2011. <<http://www.dhpe.org/infect/plague.html>>.

"Plague." *Medline Plus*. N.p., n.d. Web. 27 Feb 2011. <<http://www.nlm.nih.gov/medlineplus/ency/article/000596.htm>>.

"Plague: The Black Death." *National Geographic*. N.p., n.d. Web. 27 Feb 2011. <<http://science.nationalgeographic.com/science/health-and-human-body/human-diseases/plague-article/>>.

"Plague." *Wisconsin Division of Public Health*. N.p., n.d. Web. 27 Feb 2011. <[http://www.dhs.wisconsin.gov/communicable/factsheets/PDFfactsheets/Plague\\_42159\\_1005.pdf](http://www.dhs.wisconsin.gov/communicable/factsheets/PDFfactsheets/Plague_42159_1005.pdf)>.

"Rat Repellent." *Get Rid of Pests*. N.p., n.d. Web. 27 Feb 2011. <<http://www.get-rid-of-pests.com/rat-repellent/>>.

"The Black Death of 1348 to 1350." *History Learning Site*. N.p., n.d. Web. 27 Feb 2011. <[http://www.historylearningsite.co.uk/black\\_death\\_of\\_1348\\_to\\_1350.htm](http://www.historylearningsite.co.uk/black_death_of_1348_to_1350.htm)>.

"The Black Death: The Bubonic Plague." *The Middle Ages*. N.p., n.d. Web. 27 Feb 2011. <<http://www.themiddleages.net/plague.html>>.

"Weapons of Mass Destruction." *Global Security*. N.p., n.d. Web. 27 Feb 2011. <[http://www.globalsecurity.org/wmd/intro/bio\\_plague.htm](http://www.globalsecurity.org/wmd/intro/bio_plague.htm)>.

"What Happened to the Bubonic Plague." *All Sands*. N.p., n.d. Web. 27 Feb 2011. <[http://www.allsands.com/history/events/blackplaguebub\\_eq\\_gn.htm](http://www.allsands.com/history/events/blackplaguebub_eq_gn.htm)>.